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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

INDUSTRIAL FISHERY PRODUCTS

SITUATION AND OUTLOOK

1972 ANNUAL REVIEW

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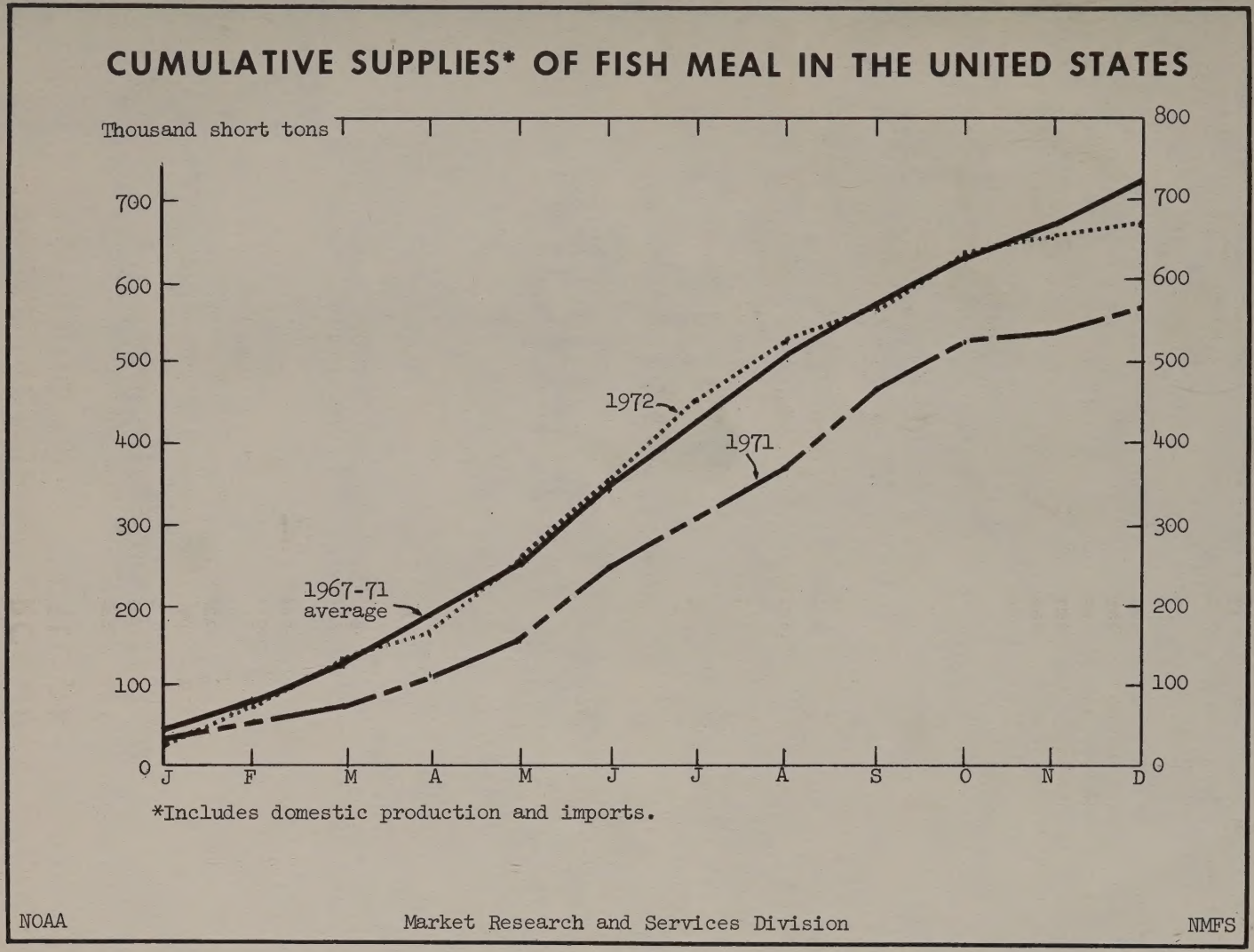
CUMULATIVE SUPPLIES* OF FISH MEAL IN THE UNITED STATES
Thousand short tons
800
700
600
500
400
300
200
100
0
1972
1971
1967-71
average
J
F
M
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M
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N
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*Includes domestic production and imports.
NOAA
Market Research and Services Division
NMFS

Figure 1

INDUSTRIAL FISHERY PRODUCTS SITUATION AND OUTLOOK

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SUMMARY

FISH MEAL

Total supplies in 1972 up 18 percent over year earlier, but gain does not reflect impact of late-year cutoff of Peruvian imports. Domestic production overall 3 percent less than a year ago. Menhaden production lower but tuna, mackerel, and anchovy meal increased. Imports heavier during first three quarters, but dropped seriously during last quarter as a result of anchoveta resource problems in Peru.

World production for January-September down 20 percent from a year earlier, but full year figures (when available) will show even greater drop. Peru postponed normal September opening of anchoveta season, and fishing not to be resumed until March 1973, at the earliest.

High beginning stocks supported FEO[1/] exports in January-September at record levels, but FEO stocks on October 1, 1972, at their lowest level in recent years.

Fish meal prices up sharply--at an all time high--following disappearance of Peruvian anchoveta. Soybean meal prices also higher, and price ratio of fish meal-soybean meal dropped.

Outlook for the first quarter of 1973 is: no significant imports from Peru, and total imports during period will be less than 5,000 tons compared with 112,000 tons a year ago. Domestic production to increase slightly. Broiler production likely to increase at slower rate, and the fish meal-soybean meal price ratio will favor continued fish meal use. Prices for both fish meal and soybean meal will continue high.

FISH SOLUBLES

Supplies of fish solubles up 22 percent, with a larger share from tuna, mackerel, and anchovy. Prices, although lower on the average, fluctuated sharply. Outlook for first quarter 1973 indicates increased usage, price rise and production up from year before.

FISH OIL

Production of 1972 down 29 percent from 1971; however, still slightly above recent 5-year average. Industrial use for fish oil up, mainly because of its lower price. Exports down, but above 5-year average. Prices recovered after a low in April. Outlook for fish oil in first quarter of 1973 calls for a slight increase in production and exports.

1/ Fishmeal Exporters Organization: member countries are Angola, Chile, Iceland, Norway, Peru, and South Africa.

FISH MEAL

REVIEW

Supplies

Total U.S. supplies in 1972--production plus imports--were about 667,000 tons,2/ which was 101,000 tons--or 18 percent--above 1971. Imports for the year were above a year earlier, and domestic production was down slightly (table 1). There was more fish meal available in the United States through most of 1972 compared with a year earlier although supplies were dropping sharply at the end of the year. The late-year drop came when imports from Peru were cut off following what appeared to be a temporary resource disaster in the Peruvian anchoveta fishery, which supplies the raw material for Peru's meal production. Peru normally is the source of about 70 percent of United States imports of fish meal, and between 40 percent and 50 percent of total United States supplies.

Table 1.--Supplies, production, and imports of fish meal in the United States, by month, 1970-72 1/

Month	Supplies			Production			Imports		
	1970	1971	1972 2/	1970	1971	1972 2/	1970	1971	1972 2/
	Thousand short tons								
January	24.0	38.0	24.7	3.9	4.6	6.4	20.1	33.3	18.3
February	26.2	19.3	53.0	4.8	3.5	4.9	21.4	15.8	48.1
March	25.4	17.6	51.0	5.9	4.4	5.4	19.5	13.3	45.6
April	62.9	45.6	35.7	8.0	13.8	11.8	54.9	31.8	23.9
May	61.2	40.8	94.8	26.5	30.2	35.6	34.7	10.5	59.2
June	80.1	88.4	90.0	46.5	58.1	38.5	33.5	30.2	51.4
July	61.0	57.5	102.6	50.7	51.7	43.2	10.2	5.8	59.4
August	49.7	65.6	71.1	39.4	51.0	55.8	10.3	14.7	15.3
September	39.6	91.3	45.8	28.7	28.4	28.0	10.9	62.9	17.8
October	30.1	56.1	71.1	22.4	19.0	24.9	7.8	37.1	46.2
November	18.3	17.8	15.6	12.3	13.3	13.3	6.0	4.5	2.3
December	30.0	28.1	10.2	7.7	4.8	5.8	22.3	23.3	4.5
Total 3/	508.5	566.1	666.9	257.0	282.9	275.0	251.5	283.2	392.0

1/ Excludes meal made from shellfish.
2/ Preliminary.
3/ Figures may not add to total because of rounding.

2/ In general, domestic figures are expressed in short tons and foreign figures in metric tons. Short tons are used in this report unless otherwise specified. To convert metric tons to short tons; multiply by 1.023.

Table 2.--U.S. fish meal production by raw material source, 1967-71 average, 1971, and 1972

Time period	Source			Total 1/
	Menhaden	Tuna, mackerel, and anchovy	Unclassified	
	Thousand short tons			
1967-71 average				
January-September	143.5	25.1	33.5	202.1
October	10.9	4.2	3.3	18.4
November	8.0	3.6	1.9	13.6
December	3.9	3.2	1.3	8.4
Total 1/	166.3	36.2	40.1	242.5
1971				
January-September	199.6	25.6	20.6	245.8
October	12.6	3.7	2.6	19.0
November	7.7	4.8	0.8	13.3
December	1.1	2.9	.9	4.8
Total	221.0	37.0	24.9	282.9
1972 2/				
January-September	168.4	40.9	21.7	231.0
October	16.3	5.8	2.9	24.9
November	7.2	5.0	1.1	13.3
December	1.5	3.6	0.7	5.8
Total 1/	193.4	55.2	26.4	275.0

1/ Figures may not add to total because of rounding.
2/ Preliminary.

Table 3.--Menhaden meal production, by area, 1967-71 average, 1971, and 1972[1/]

Time period	Area		Total [2/]	Percentage of total production	
	Atlantic Coast	Gulf Coast		Atlantic Coast	Gulf Coast
	Thousand short tons			Percent	
1967-71 average					
January-September	33.9	109.6	143.5	23.6	76.4
October	6.7	4.2	10.9	61.5	38.5
November	[3/] 8.0	-	8.0	100.0	-
December	3.9	-	3.9	100.0	-
Total	52.5	113.8	166.3	31.6	68.4
1971					
January-September	41.3	158.3	199.6	20.7	79.3
October	6.3	6.3	12.6	50.0	50.0
November	[3/] 7.7	-	7.7	100.0	-
December	1.1	-	1.1	100.0	-
Total [2/]	56.4	164.6	221.0	25.5	74.5
1972					
January-September	60.3	108.1	168.4	35.8	64.2
October	11.6	4.7	16.3	71.2	28.8
November	[3/] 7.2	-	7.2	100.0	-
December	1.5	-	1.5	100.0	-
Total [2/]	80.6	112.8	193.4	41.7	58.3

1/ Includes a small amount of meal from other species.
2/ Figures may not add to total because of rounding.
3/ Includes a small amount of meal produced on the Gulf Coast.

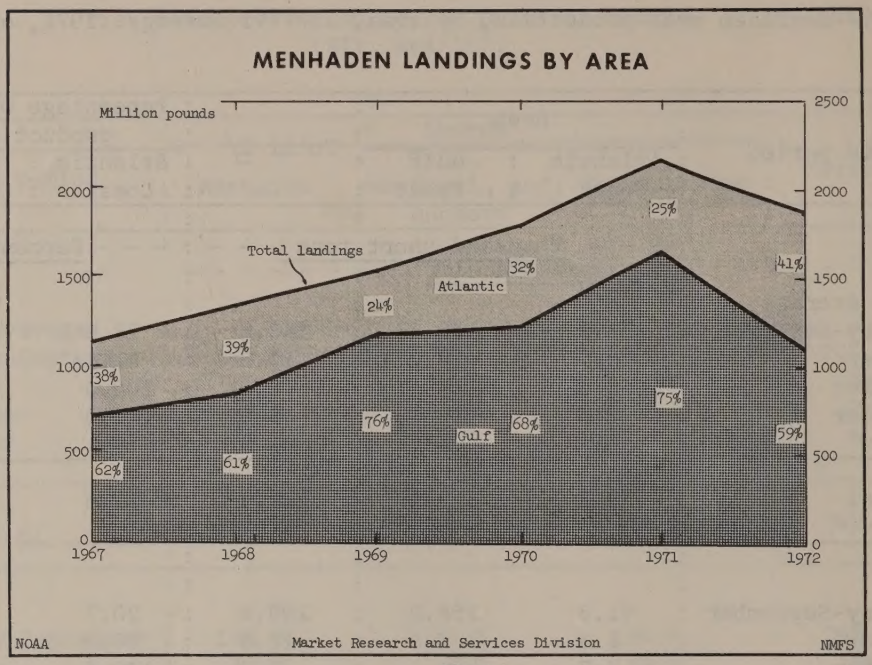

Figure 2

Domestic Production Less Than in 1971

U.S. fish meal plants produced about 275,000 tons of fish meal during 1972--3 percent less than a year earlier (table 2). Production during the first three quarters of the year was off considerably more, but this was partially offset by heavier production in October and again in December. Of the total fish meal produced in 1972, about 193,400 tons--or 70 percent--came from menhaden.

Production of tuna, mackerel, and anchovy meal was 55,200 tons in 1972, about 18,000 tons more than during 1971. Increased landings in the reduction fishery for California anchovy during the latter part of 1971-72 season contributed to the increase. Landings for the 1972-73 anchovy season, which began August 1 in the Northern area and September 15 in the Southern area, were about 34,500 tons through December, 65 percent higher than a year before.

Menhaden Landings Below 1971

Menhaden landings in the United States for 1972 were about 1.9 billion pounds--down about 13 percent the same period a year ago but 18 percent above the 1967-71 average. As a result of bad weather, January-September 1972 landings on the Gulf Coast dropped to 1.1 billion pounds, compared with 1.5 billion pounds a year earlier (table 4). October landings were also below the previous year, and the Gulf catch for the season was 31 percent less than the year before.

Table 4.--Menhaden landings by area, 1967-71 average, 1971, and 1972

Time period	Area		Total 1/	Percentage of total landings	
	Atlantic Coast	Gulf Coast		Atlantic Coast	Gulf Coast
	Million pounds			Percent	
1967-71 average					
January-September	315.9	1,056.2	1,372.1	23.0	77.0
October	60.6	41.0	101.6	59.6	40.4
November	3/74.4	-	74.4	100.0	-
December	36.7	-	36.7	100.0	-
Total 1/	487.7	1,097.2	1,584.9	30.8	69.2
1971					
January-September	405.3	1,536.7	1,942.0	20.9	79.1
October	60.8	62.9	123.7	49.2	50.8
November	3/74.1	-	74.1	100.0	-
December	10.2	-	10.2	100.0	-
Total	550.4	1,599.6	2,150.0	25.6	74.4
1972 2/					
January-September	575.0	1,057.2	1,632.2	35.2	64.8
October	109.5	45.2	154.7	70.8	29.2
November	3/67.4	-	67.4	100.0	-
December	14.0	-	14.0	100.0	-
Total 1/	766.0	1,102.4	1,868.4	41.0	59.0

1/ Figures may not add to total because of rounding.
2/ Preliminary.
3/ Includes landings on the Gulf Coast.

Menhaden landings on the Atlantic Coast increased measurably in 1972 and gave the area a larger share of the total U.S. catch of menhaden. Landings for the Atlantic Coast were 766 million pounds in 1972--which represented a 39-percent gain over 1971. Atlantic Coast landings were 41 percent of the total in 1972 compared with 26 percent in 1971 (fig. 2).

Imports Up Sharply From 1971

The United States imported about 392,000 tons of fish meal during 1972--38 percent more than a year before--with all gains occurring before November. Peru, the major supplier, ceased shipping meal in October, when it became necessary to postpone the start of the Peruvian anchoveta fishing season be-

Table 5.--U.S. imports of fish meal by country of origin, 1967-71 average, 1971, and 1972

Time period	Country of origin					Total 1/
	Canada	Chile	Norway	Peru	Other	
	Thousand metric tons					
1967-71 average						
January-September	47.1	32.2	27.6	260.7	4.2	371.9
October	7.0	5.1	3.0	17.2	0.3	32.7
November	4.3	3.1	5.7	16.6	.4	30.2
December	4.1	2.8	2.9	35.3	.1	45.2
Total 1/	62.5	43.3	39.2	329.9	5.1	480.0
1971						
January-September	44.8	-	15.0	157.1	1.4	218.3
October	5.0	-	8.9	23.1	0.2	37.1
November	4.4	-	-	-	.1	4.5
December	3.3	-	0.6	19.4	-	23.3
Total 1/	57.6	-	24.4	199.6	1.6	283.2
1972 2/						
January-September	20.7	-	10.5	306.4	1.6	339.1
October	3.7	-	-	42.5	-	46.2
November	2.2	-	-	-	0.1	2.3
December	1.0	-	3/	3.4	-	4.5
Total 1/	27.6	-	10.5	352.3	1.6	392.0

1/ Figures may not add to total because of rounding.
2/ Preliminary.
3/ Less than 0.05.

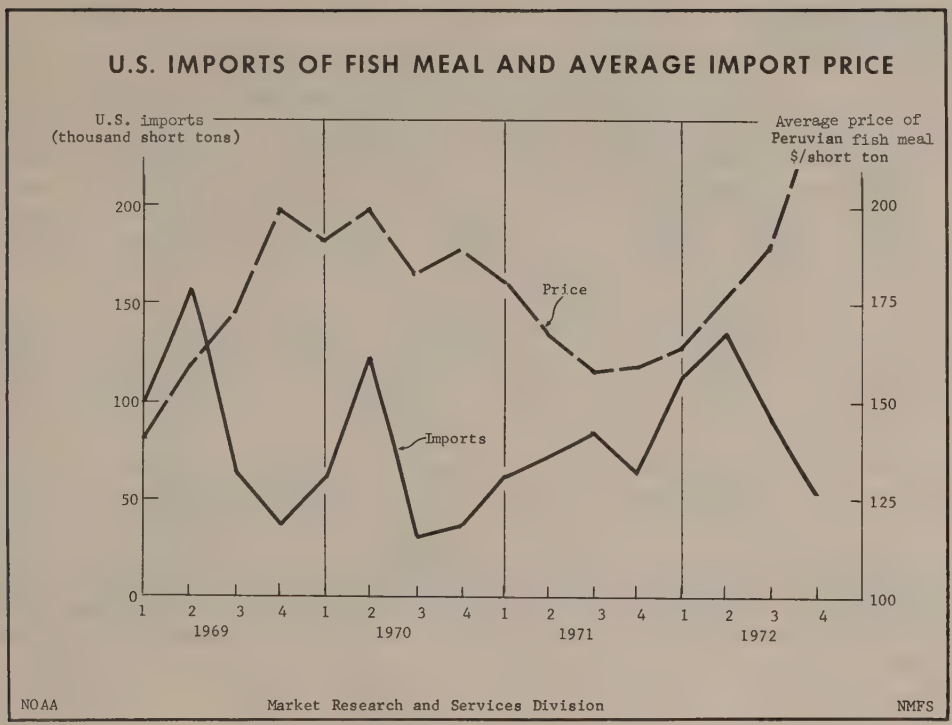

Figure 3

cause of the unavailability of the resource. (See Appendix.) Heavier imports were attributable to a decline in prices for fish meal in world markets that began in 1971 and lasted through May of 1972. During this period, U.S. buyers re-entered the market (fig. 3). During the period of high prices in 1970, feed mixers in the United States substituted other ingredients for fish meal. The following table shows comparative imports, by quarters, for 1971 and 1972.

Table 6.--Change in U.S. fish meal imports, 1971-72

	Imports		Percentage change
	1971	1972	
	Thousand short tons		Percent
1st quarter	62.4	112.0	+ 79
2d quarter	72.5	134.5	+ 86
3d quarter	83.4	92.5	+ 11
4th quarter	65.0	52.9	- 19

World Production of Fish Meal Drops

World production of fish meal in 1972 was down sharply from a year earlier, reflecting chiefly the anchoveta resource problems in Peru. Other important producing countries also had lower production, however. Output in Chile during the first three quarters of 1972 was down considerably, owing to the anchoveta problem because Chile's fish meal production uses the same resource base as Peru. Production in Canada, Norway, Denmark, and South Africa also was off, compared with a year earlier.

Only two of the eight fish meal exporting countries increased their fish meal production for the period January-September 1972. The total production for all eight countries was 20.3 percent less than the same period last year (table 7).

Production in Peru, which recently has supplied about 40 percent of the total world production, was 850,000 tons in January-September--down 28 percent from 1971--the result of a resource phenomena termed "El Nino." This was a shift in sea currents off the Peruvian Coast which caused the anchoveta to disappear during 1972. The problem came to light near the end of the 1971-72 fishing season when Peruvian anchoveta fishermen were having considerably less success than a year earlier. By September 1972, the problem was confirmed and the normal 1972-73 fishing season opening was postponed indefinitely.

Table 7.--Production of fish meal in eight major exporting countries, January-September, 1967-71 average, 1971, and 1972

Country	Thousand metric tons			Percentage of total production		
	1967-71 average	1971	1972 1/	1967-71 average	1971	1972
Angola	41.7	35.0	90.0	1.7	1.5	4.7
Canada	89.4	77.0	2/90.0	3.7	3.2	4.7
Chile	134.6	180.0	59.0	5.6	7.7	3.1
Denmark	158.1	199.0	2/180.0	6.6	8.5	9.5
Iceland	66.6	68.0	70.0	2.8	2.9	3.6
Norway	329.4	363.0	340.0	13.7	15.5	17.8
Peru	1,258.0	1,174.0	850.0	52.4	50.2	44.5
South Africa	323.1	247.0	229.0	13.5	10.5	12.1
Total	2,400.9	2,343.0	2/1,908.0	100.0	100.0	100.0

1/ Preliminary.
2/ Estimated.
Sources: Fishmeal Exporters Organization and International Association of Fish Meal Manufactuers.

Peru's research organization, IMARPE, in conjunction with FAO, had reported that the quantities of young anchoveta (recruits) which appeared during the first half of 1972 were easily the lowest ever recorded, possibly amounting to only one-seventh of the quantity in an average year.

Table 8.--Average number of recruits per catch in March over past 11 years

Year	Number
1962	258
1963	178
1964	397
1965	170
1966	365
1967	300
1968	252
1969	285
1970	390
1971	335
*1972	54

(March is used as an example, since this is generally the month which has the highest number of recruits).

Source: IMARPE.

*Preliminary.

An attempt was made, apparently, to land a sufficient quantity for Peru to honor its shipping committments toward the end of the 1971-72 season, although warnings about the future of the fishery were heard from IMARPE and FAO. Fishing, nevertheless, came to a standstill on June 23. Although normal closure of the fishery extends from June through August to protect the adult fish during spawning, the closure has lasted through December. In late November, the Peruvian Government lifted the ban on anchoveta fishing to a limited extent. Fishing was permitted for a period of 10 days beginning December 4, 1972. The ban was reportedly removed to test the condition of the resource and to help meet domestic consumption needs. The results proved disappointing; the bulk of the catch consisted of immature anchoveta, which were commercially unacceptable. Trial efforts on a smaller scale have continued. Full-scale commercial fishing will not begin until in March at the earliest.

Chile's production, although small relative to Peru, also showed the effects of "El Nino"; production declined 67 percent to 59,000 tons in January-September.

Norwegian production of fish meal, which declined 6.3 percent from the 363,000 tons produced in 1971, was still slightly above the 1967-71 average. Angola and Iceland were able to increase their production for January-September; however, their relatively small contributions had little effect on total world production.

Table 9.--Anchovy landings in Peru, by month, 1967-72

Month	1967	1968	1969	1970	1971	1972
	Thousand metric tons					
January	1,598	1,551	1,341	2,152	132	30
February	602	1,026	86	1,084	151	160
March	930	847	1,897	1,090	2,578	1,830
April	1,263	1,193	1,320	2,030	1,573	1,560
May	1,108	1,023	898	975	690	535
June	145	-	56	179	98	155
July	-	66	20	16	-	-
August	-	88	1	-	-	-
September	262	1,349	486	1,335	1,205	-
October	1,245	1,277	552	1,382	1,358	-
November	1,266	950	407	1,107	1,155	70
December	1,406	892	1,896	926	1,342	120
Total	9,825	10,262	8,960	12,276	10,282	4,460

Source: Oil World Weekly, December 8, 1972 and January 5, 1973.

FEO Exports at Record Level

Fish meal exports by members of the Fishmeal Exporters Organization (FEO) were an estimated 2,124,000 metric tons for the first 9 months of 1972 (table 10). Although this amount was 26 percent higher than same period last year, it approximates the export levels for the comparable period in 1969 and 1970. It should be noted, however, that these totals were relatively unaffected by the Peruvian situation.

Peru's exports were about 71 percent of total FEO exports. Compared with the same period last year, Peru's exports increased by 31 percent; this was attributed primarily to the active sales efforts of Peru's official marketing organization (EPCHAP) and lower prices in the first part of the year. Peru's exports for the first 2 months of 1972 were about double the amount for the same months in 1971 (table 11).

However, the occurence of "El Nino" prompted the Peruvian Government to ban exports of fish meal and oil from October 1, 1972, until further notice. The government announced that unfilled orders for 400,000 tons would be shipped "on a pro rata basis as supplies become available."

Table 10.--Total FEO 1/ exports of fish meal, by month, 1967-71 average, 1971, and 1972

Month	1967-71 average	1971	1972 2/
	Thousand metric tons		
January	207.6	150.5	273.5
February	227.9	144.4	256.9
March	234.3	159.2	230.4
April	238.3	195.5	273.4
May	249.5	185.0	257.2
June	225.4	173.6	263.7
July	234.1	3/192.8	210.6
August	189.0	3/192.9	184.2
September	195.5	3/296.0	174.5
October	187.8	3/211.8	
November	230.0	3/278.8	
December	247.4	3/314.9	
Total 4/	2,666.3	3/2,495.7	

1/ Fishmeal Exporters Organization: members are those countries listed in table 12.
2/ Preliminary.
3/ Estimated.
4/ Figures may not add to total because of rounding.

Sources: Fishmeal Exporters Organization, Oil World Weekly, and International Association of Fish Meal Manufacturers.

Table 11.--Peruvian fish meal exports, 1971 and 1972

	Fish meal exports from Peru		Percentage change
	Thousand metric tons		Percent
	1971	1972 1/	
January	98.6	202.1	+105.0
February	96.0	191.6	+ 99.6
March	89.3	154.3	+ 72.8
April	141.2	190.2	+ 34.7
May	127.5	184.8	+ 44.9
June	112.2	207.5	+ 84.9
July	141.6	127.1	- 10.2
August	111.6	129.0	+ 15.6
September	229.4	114.4	- 50.1
October	141.7	NA	
November	210.3	NA	
December	249.2	NA	
Total	1,749.6		

1/ Estimated.

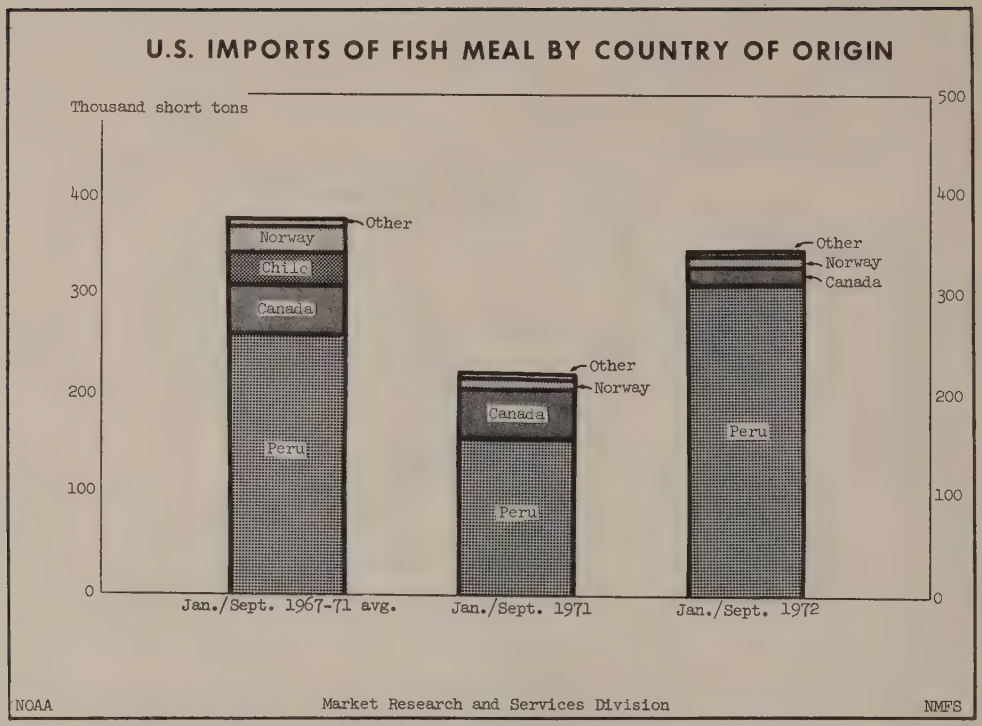

Figure 4

Table 12.--Exports of fish meal from FEO countries, January-September, 1967-71 average, 1971, and 1972

Country	1967-71 average	1971	1972 1/	Percentage of total exports: 1967-71 average	1971	1972
	Thousand metric tons			Percent		
Angola	41.5	32.1	84.3	2.1	1.9	4.0
Chile	115.8	163.8	78.1	5.8	9.7	3.7
Iceland	64.3	50.0	67.2	3.2	3.0	3.2
Norway	253.1	229.2	294.5	12.7	13.6	13.8
Peru	1,334.6	1,147.0	1,501.0	66.7	68.1	70.6
South Africa	190.5	62.0	99.3	9.5	3.7	4.7
Total	1,999.8	1,684.1	2,124.4	100.0	100.0	100.0

1/ Preliminary.

Source: Fishmeal Exporters Organization.

Table 13.--FEO 1/ exports of fish meal, by country of destination, January-September, 1970-72

Country	FEO exports			Percentage of total FEO exports		
	1970	1971	1972 2/	1970	1971	1972
	Thousand metric tons			Percent		
EEC						
Belgium	32.3	20.4	18.0	1.6	1.2	0.8
France	56.5	32.6	48.1	2.8	1.9	2.3
Germany, West	478.9	371.7	390.7	23.4	22.1	18.4
Italy	93.2	63.1	98.7	4.6	3.8	4.6
Netherlands	182.9	106.3	168.9	8.9	6.3	8.0
Total	(843.8)	(594.1)	(724.4)	(41.3)	(35.3)	(34.1)
United States 3/	133.3	147.0	307.5	6.5	8.7	14.5
East European Countries 4/	372.9	369.1	349.6	18.2	21.9	16.5
Scandinavian Countries 5/	72.8	66.9	79.2	3.6	4.0	3.7
Latin American Countries 6/	94.8	148.1	141.9	4.6	8.8	6.7
Other						
Japan	84.4	16.6	37.0	4.1	1.0	1.7
Spain	110.7	86.0	86.0	5.4	5.1	4.0
United Kingdom	210.4	120.2	175.7	10.3	7.1	8.3
Other	122.6	136.1	223.1	6.0	8.1	10.5
Total	(528.1)	(358.9)	(521.8)	(25.8)	(21.3)	(24.5)
TOTAL	2,045.7	1,684.1	2,124.4	100.0	100.0	100.0

1/ Fishmeal Exporters Organization.
2/ Preliminary.
3/ Based on export figures reported by FEO countries.
4/ Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, and Yugoslavia.
5/ Denmark, Finland, and Sweden.
6/ Argentina, Bolivia, Brazil, Columbia, Cuba, Mexico, and Venezuela.

Source: Fishmeal Exporters Organization.

Some of the factors which tended to keep world consumption of fish meal at high levels were: high prices for livestock and livestock products and comparatively low prices for fish meal; generally lower prices for fish meal relative to oilseed meals; and continued strong demand from the East European countries for feed ingredients. Speculation concerning the possible size of the Soviet Union's purchase of United States soybeans during the summer also served to bolster demand for protein feed ingredients, both in the United States and abroad.

Exports of fish meal to the EEC countries for the January-September period totalled 724,400 metric tons, a 22-percent increase over the same period in 1971 but still below exports for the comparable 1970 period. Figures for the final quarter were not available for this report, but indications are that fourth quarter exports will be very much below a year earlier as a result of the dwindling of supplies in Peru.

The Federal Republic of Germany, although continuing to be the largest FEO market, took a smaller share (18.4 percent of total FEO exports) than for comparable periods in the last 2 years (table 13). Among other West European countries, France, the United Kingdom, and the Netherlands increased their imports by 48, 46, and 59 percent, respectively.

The United States during January-September imported 307,500 metric tons or about 14.5 percent of total FEO exports. The United States ranked as the second largest importer of fish meal from FEO countries (table 13).

FEO Fish Meal Stocks Low

Fish meal stocks held by FEO countries on October 1, 1972, were at their lowest level in recent years (table 14). Stocks were 309,700 metric tons, less than one-third October 1, 1971, stocks and less than one-half the average amount held for 1967-71.

About 22 percent of FEO stocks were held by Peru. However, October 1 stocks in Peru were only one-tenth of the previous year's level. The decline in Peru's stocks during 1972 was caused by a substantial increase in exports in the first half of the year and later by the subsequent decline in production caused by "El Nino."

The stock-sales ratio for FEO countries reached its lowest level during the third quarter of 1972 (table 15). This overall increase in the turnover of fish meal inventories began last year after the stock-sales ratio had reached relatively high levels in the first and second quarters of 1971.

Table 14.--FEO 1/ fish meal stocks held October 1, 1967-71 average, 1971, and 1972

Country	1967-71 average	1971	1972 2/	Percentage of FEO total stocks: 1967-71 average	1971	1972
	Thousand metric tons			Percent		
Angola	6.3	6.0	20.0	1.0	0.5	6.5
Chile	28.9	45.0	2.0	4.5	4.3	0.7
Iceland	10.1	11.0	2.7	1.6	1.1	.9
Norway	160.2	220.0	146.0	24.9	21.4	47.1
Peru	359.1	648.0	68.0	55.8	62.9	21.9
South Africa	78.7	100.0	71.0	12.2	9.8	22.9
Total 3/	643.4	1,030.0	309.7	100.0	100.0	100.0

1/ Fishmeal Exporters Organization; members are those countries listed in table.
2/ Preliminary.
3/ Figures may not add to total because of rounding.

Source: Fishmeal Exporters Organization.

Table 15.--FEO fish meal stock-sales ratios 1/, by quarter, 1970-72

Country	1970 I	1970 II	1970 III	1970 IV	1971 I	1971 II	1971 III	1971 IV	1972 2/ I	1972 2/ II	1972 2/ III	1972 2/ IV
	Ratio											
Angola	1.43	1.61	1.68	1.09	0.99	2.00	3.07	1.29	0.74	0.63	0.63	
Chile	2.53	1.92	4.20	2.79	2.49	2.86	2.76	3.83	.93	.87	.51	
Iceland	1.36	1.47	1.86	1.79	1.94	1.83	2.07	2.51	1.41	.80	.48	
Norway	2.50	4.30	6.69	4.37	4.53	9.46	6.82	4.25	1.90	2.14	1.41	
Peru	1.80	2.54	2.88	4.52	7.83	6.81	4.79	3.43	1.23	.89	.65	
South Africa	1.22	0.79	0.94	1.18	1.14	2.12	3.87	3.28	.51	.66	1.03	
Total FEO	1.81	2.35	3.00	3.92	5.71	5.93	4.76	3.48	1.22	.93	.81	

1/ Stocks are average of beginning and end-of-quarter-sales equal exports plus local consumption.
2/ Estimated.

Table 16.--Broiler chick placements in 22 States, and average broiler price at the farm, by month, 1970-72

Month	1970		1971 1/		1972 1/	
	Chicks placed 2/	Broiler price	Chicks placed 2/	Broiler price	Chicks placed 2/	Broiler price
	Million	Cents/lb.	Million	Cents/lb.	Million	Cents/lb.
January	256.4	14.8	250.4	13.0	260.5	13.4
February	240.7	14.3	226.2	13.7	256.4	14.6
March	278.8	14.8	263.8	13.7	282.2	14.5
April	275.7	13.7	263.8	13.6	277.8	13.1
May	282.0	13.9	271.4	14.3	285.0	13.6
June	269.4	13.3	263.0	14.9	271.7	14.3
July	253.6	13.6	254.4	15.9	259.8	15.7
August	246.4	13.2	254.8	14.3	260.2	14.6
September	211.0	13.4	227.0	14.2	229.6	15.5
October	215.6	12.8	225.9	13.0	237.3	14.6
November	233.4	12.9	238.0	12.6	239.9	13.8
December	245.9	11.8	252.6	12.1	249.7	14.0
Total placements 3/ and average price	3,008.9	13.5	2,991.2	13.8	3,110.2	14.3

1/ Preliminary.
2/ Weekly broiler chick placements prorated between months.
3/ Figures may not add to total because of rounding.

Sources: Commercial Broilers: Annual Production and Weekly Placements, and Delmarva Broiler Chick Report, U.S. Department of Agriculture, Statistical Reporting Service, and Poultry and Egg Situation, U.S. Department of Agriculture, Economic Research Service.

Table 17.--Average monthly price of soybean meal 1/ at Decatur, Ill., 1970-72

Month	1970	1971	1972
	Dollars per short ton		
January	97.60	86.10	89.40
February	95.60	82.40	91.50
March	79.60	82.00	98.60
April	83.10	80.50	101.80
May	78.90	84.80	103.30
June	82.70	87.60	104.90
July	92.50	90.00	111.60
August	92.50	84.20	111.00
September	88.20	80.00	117.90
October	83.80	80.80	118.60
November	82.50	79.20	133.00
December	88.20	88.50	196.00
Average 2/	86.80	83.90	3/115.60

1/ 50 percent protein, bulk.
2/ Average weighted by monthly production of soybean meal and cake.
3/ Estimated.
Source: Feed Market News, U.S. Department of Agriculture, Consumer and Marketing Service, Grain Division.

Demand

Broiler Placements Up 5 Percent

Based on increased broiler placements, from which fish meal in the United States is derived, there was an apparent increase in the demand for fish meal during 1972. About 3.1 billion broiler chicks were placed on farms in the leading broiler-producing States during 1972 (table 16). These placements were about 4 percent more than in 1971. During January-September, broiler placements were about 5 percent higher than a year before but declined during the last quarter of the year.

Prices paid for broilers at the farm in 1972 averaged 14.3 cents per pound--slightly higher than the year before. Larger output of broilers kept the prices from rising despite relatively high prices of other meat and increases in consumer income.

Higher Soybean Meal Prices A Factor in Demand for Fish Meal

Another factor in heavier demand for fish meal during 1972 was the sharp increase in the prices of soybean meal. Fish meal prices advanced, starting at midyear, but soybean meal prices climbed at a more rapid rate, thus encouraging some substitutions between fish meal and soybean meal in feed mixes. Soybean meal advanced in price from $89.40 per ton (Decatur, Ill.) in January to $195.00 per ton in December (table 17). Domestic menhaden meal during this period rose from $164.70 per ton (f.o.b. East Coast and Gulf points) to $237.50 per ton. The different percentage rate of change in prices is shown in the following table.

Table 18.--Change in prices of soybean meal and menhaden meal, 1972

	Average monthly price		Percentage change
	January - December		
	Dollars per short ton		Percent
Price of soybean meal	89.40	195.00	+118.1
Price of menhaden meal	164.70	237.50	+ 44.2

The increase in the soybean meal price is attributable to the reduction of supplies of soybeans for domestic crushing. U.S. soybean meal production in January-September 1972 was about 5 percent lower than year earlier while a larger number of poultry and livestock suggest an increased demand for the meal.

Adverse harvest weather and crop losses caused soybean meal prices to increase rapidly at the beginning of December. Prices increased from $139.50 per ton at Decatur, Ill., on November 28 to $214 per ton on December 26--a 53-percent jump in 1 month. Fish meal prices did not increase proportionally, and as a result, the ratio between the price of Peruvian fish meal and, the price of soybean meal declined.

The average ratio of fish meal price to soybean meal price in 1972 was 1.68:1--compared to 1.98:1 during 1971. The lower ratio indicates that the competitive position of fish meal as a source of protein was better in 1972 than a year before (table 19).

Table 19.--Ratio of Peruvian fish meal price 1/ to soybean meal price 2/, by month, 1970-72

Month	1970	1971	1972
	Price ratio		
January	2.02	2.14	1.83
February	1.92	2.17	1.79
March	2.42	2.16	1.67
April	2.38	2.20	1.68
May	2.56	2.00	1.75
June	2.37	1.79	1.68
July	2.01	1.72	1.62
August	1.94	1.90	1.73
September	2.09	1.99	1.65
October	2.26	1.95	1.78
November	2.28	1.99	1.74
December	2.11	1.79	1.24
Average	2.24	1.98	3/1.55

1/ F.o.b. East Coast ports, 65 percent protein, as quoted at New York City.
2/ Wholesale at Decatur, Ill., 50 percent protein, bulk.
3/ Estimated.

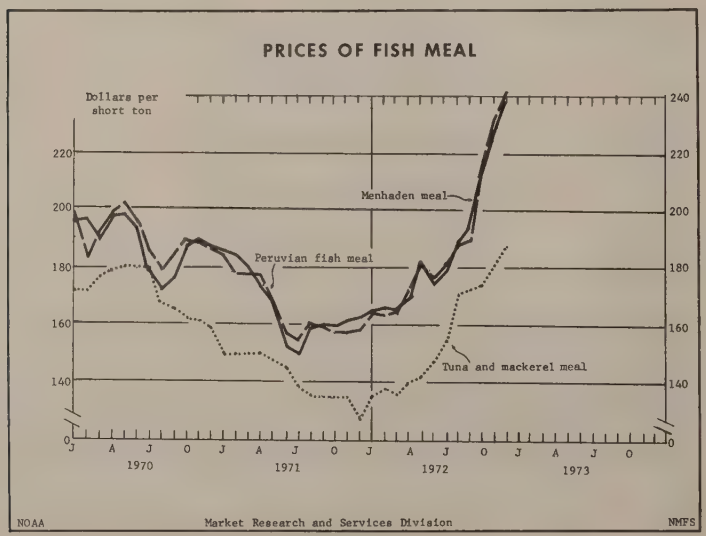

Figure 5

Fish Meal Price Advance Tied to Peruvian Anchoveta Situation

The rise in fish meal prices was attributable mainly to the adverse Peruvian anchoveta situation. When an apparent resource problem surfaced during the spring months of 1972, prices began to firm. By midyear, advances were sharp and increasing. The New York price for Peruvian fish meal was $163.30 per ton in January 1972 but reached an average of $241 in December. The availability of Peruvian meal in the United States has been light since July.

The prices of menhaden meal followed the price rise of Peruvian meal (tables 20 and 22 and fig. 5). The January 1972 quotation in New York was $164.70 per ton, and in December was $237.50 per ton. Supplies of menhaden meal were reported exhausted at the end part of December, and consequently prices for this meal were not quoted. The increase of fish meal prices was attributed to 1) the increasing shortage of fish meal in the world markets caused by the disappearance of anchoveta off the Peruvian Coast and 2) the rapid increase of soybean meal price,--especially at the end of the year.

Table 20.--Average monthly price of Peruvian fish meal 1/, f.o.b. East Coast ports, 1970-72

Month	1970 2/	1971 3/	1972 3/
	Dollars per short ton		
January	197.50	184.10	163.30
February	183.50	178.90	163.60
March	192.70	177.30	164.00
April	198.00	177.00	171.50
May	202.10	169.40	180.60
June	195.80	156.80	176.10
July	185.90	154.50	180.90
August	179.10	160.10	192.00
September	184.00	159.00	194.90
October	189.80	157.80	210.80
November	187.80	157.50	231.00
December	186.40	158.40	241.00
Average 4/	194.70	166.10	179.20

1/ 65 percent protein, f.o.b. East Coast ports.
2/ January through March bagged, April bulk, May through July bulk and bagged, August through December bulk.
3/ Bulk.
4/ Average weighted by monthly imports of Peruvian fish meal.

Table 21.--Average monthly prices of tuna and mackerel meal 1/, at Los Angeles, 1970-72

Month	1970	1971 2/	1972 2/
	Dollars per short ton		
January	172.50	150.00	135.00
February	172.50	150.00	137.60
March	177.00	150.00	135.00
April	178.50	150.00	138.40
May	180.00	147.60	142.80
June	180.00	144.00	147.80
July	180.00	138.00	154.00
August	168.00	135.00	172.50
September	165.00	135.00	174.00
October	162.00	135.00	176.40
November	161.00	135.00	181.40
December	159.00	127.50	187.00
Average 3/	170.15	141.10	155.90

1/ 60 percent protein, bagged, as quoted by brokers at Los Angeles.
2/ Bulk.
3/ Average weighted by monthly production.

Table 22.--Average monthly price of menhaden meal 1/, f.o.b. East Coast and Gulf points, 1970-72

Month	1971	1971 2/	1972 2/
	Dollars per short ton		
January	195.90	3/ 186.50	164.70
February	196.50	3/ 184.20	165.00
March	189.90	180.00	164.70
April	197.50	174.10	168.20
May	197.50	169.20	181.10
June	193.80	153.60	175.00
July	179.00	150.10	178.50
August	172.90	159.20	189.70
September	177.80	160.30	193.90
October	187.50	160.30	210.20
November	189.10	161.80	227.50
December	187.50	162.90	237.50
Average 4/	184.80	158.00	185.50

1/ 60 percent protein, bagged, as quoted by brokers at New York City.
2/ Bulk.
3/ Mainly meal at Gulf points.
4/ Average weighted by monthly production of menhaden meal.

Past experience indicates that when fish meal prices are on the rise relative to competing feed ingredients, there is a tendency to use less fish meal in feed ration (fig. 6). However, this has not occurred because prices of other substitute ingredients, notably soybean meal, have been rising at a faster rate. As noted in the following table, soybean meal prices increased about 118 percent while fish meal prices rose 44 percent.

The increase in price of soybean meal is more important than the price of fish meal to the U.S. feed mixers, because soybean meal is used in greater proportion than fish meal in broiler ration. Soybean constitutes about 15 to 25 percent and fish meal about 2 to 8 percent of the broiler ration in the United States.

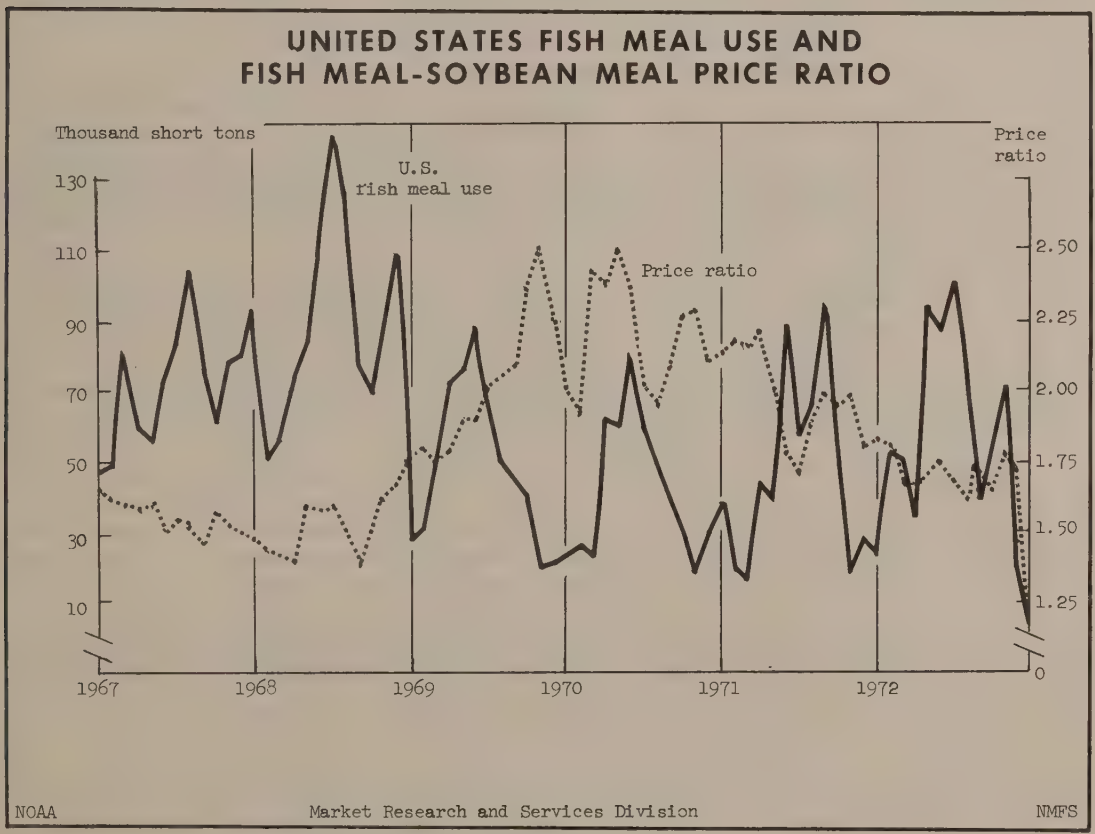

Figure 6

OUTLOOK

The outlook for fish meal markets during first quarter of 1973 is one of short supplies and high prices. Peruvian production of fish meal during the first half of 1972-73 season was negligible, and no stocks are available in Peru for export purposes. Fish meal stocks are very low in other exporting countries also. The Peruvian anchovy fishery will be closed during January and February to protect the spawners, and serious fishing off the Peruvian Coast will not begin until March, if then. Peru will fill its outstanding contracts--estimated at 400,000 metric tons--when meal becomes available. Consequently, no fish meal imports by the United States from Peru are expected during the first quarter of 1973. There will be some shipments from Canada--probably about 2,000 to 3,000 tons--and receipts from other sources will likely be very small. Thus, total imports are likely to be in the order of 3 to 5 percent of the imports a year earlier.

Production of domestic fish meal in the first 3 months of 1973 likely will be about 17,000 tons--a slight gain from a year ago. The new supplies of fish meal (imports plus domestic production) in the United States are estimated at 20,000 tons compared with 128,700 tons a year before. Although stock figures are not available, it is expected that last year's relatively high imports and domestic production will provide additional fish meal for consumption during the first quarter of 1973.

The short supply situation has set the stage for continued increase in the price of fish meal. Moreover, broiler production is likely to increase during early 1973, in spite of increased prices of feed ingredients. The Cost of Living Council has exempted chickens from price controls on the first sale, and higher prices of broilers will compensate for the increased feed cost.

Prices of fish meal are expected to continue high during the first quarter of 1973. In the first place, the Cost of Living Council has announced that manufactured feeds are not subject to mandatory controls under the Phase 3 of the Economic Stabilization Program. Thus, the processors of soybean meal and fish meal may charge whatever price the market will accept. Prices for both fish meal and soybean meal will tend to be firm to rising, and, if the current high prices persist for both, there is an increasing likelihood that feed users will turn to synthetics as protein supplements in the rations.

FISH SOLUBLES

REVIEW

Supplies

Supplies Up
22 Percent

Total fish solubles available in the United States in 1972 were about 135,400 tons--up about 22 percent from the 111,200 tons a year earlier (table 23). Domestic production accounted for all but about 80 tons of this. About 104,500 tons of solubles were made from menhaden compared to 91,500 tons a year before. About 30,800 tons came from other species, 56 percent more than during 1971.

Demand

Prices of menhaden solubles in 1972, as quoted by brokers in New York City, were considerably lower than a year before but fluctuated more sharply. The $40.40 per ton of January declined to $35.90 in March and April, increased again to $40.10 in June, and slightly dropped to $39.75 in July. Prices of menhaden solubles increased since July and reached $72.50 per ton in December indicating a relative strong demand for solubles (table 24).

Prices of menhaden meal began to rise earlier in 1972, making the use of solubles more advantageous to feed mixers. Although prices of solubles increased faster than prices of fish meal during the second half of the year, meal-solubles price margins continued to favor the use of solubles.

OUTLOOK

Further price rises in menhaden solubles can be expected during the first quarter of 1973, but the shortage of fish meal will encourage greater use of fish solubles. Because little or no menhaden is landed during the first quarter, the production of fish solubles depends on the landings of anchovy, tuna and mackerel. We expect the production of fish solubles to be close to 7,000 tons. Because of seasonally low domestic production, some solubles are likely to be imported during the first quarter of 1973.

Table 23.--Total fish solubles available in the United States: production plus imports, by month, 1970-72

Month	1970	1971	1972 1/
	Thousand short tons		
January	1.3	1.0	2.5
February	2.1	1.2	2.1
March	2.5	1.5	2.4
April	3.5	5.1	5.2
May	9.8	13.0	13.4
June	15.7	22.6	20.7
July	18.8	19.4	22.0
August	14.0	19.7	28.7
September	11.3	11.4	12.7
October	9.8	8.0	14.4
November	4.0	6.5	8.4
December	2.9	1.7	3.0
Total 2/	95.4	111.2	135.4

1/ Preliminary.
2/ Figures may not add to total because of rounding.

Table 24.--Average monthly price of menhaden solubles 1/, f.o.b. East Coast plants, 1970-72

Month	1970	1971	1972
	Dollars per short ton		
January	51.25	51.25	2/40.40
February	50.90	51.25	38.05
March	51.75	51.25	35.90
April	52.80	50.60	35.90
May	3/54.70	48.90	38.90
June	3/54.30	49.00	40.10
July	51.90	48.10	39.75
August	50.45	47.15	40.60
September	48.70	45.05	42.80
October	50.60	43.10	52.75
November	50.65	42.70	66.90
December	49.70	42.50	72.50
Average 4/	51.90	47.30	43.45

1/ In tank cars; prices quoted by brokers at New York City.
2/ East and Gulf Coasts.
3/ F.o.b. Gulf Coast plants only.
4/ Weighted average.

FISH OIL

REVIEW

Supplies

Production Down
From Last Year

The domestic industry produced an estimated 187.9 million pounds of fish oil in 1972--29 percent less than during the same period 1971, but about the same as the 1967-71 average (tables 25 and 26). About 88 percent of the total production was menhaden oil--slightly less than the year before.

Table 25.--U.S. production of fish oil 1/, by month, 1970-72

Month	1970	1971	1972 2/
	Million pounds		
January	0.6	1.5	1.8
February	.6	0.6	1.0
March	.6	.7	0.8
April	2.9	11.6	4.0
May	21.7	28.4	31.3
June	39.8	57.3	27.6
July	40.8	53.2	32.5
August	41.1	55.7	47.0
September	27.4	29.4	18.9
October	19.3	17.3	18.1
November	7.2	8.0	3.9
December	3.0	1.3	1.1
Total 3/	205.1	265.0	187.9

1/ Excludes small amount of whale oil.
2/ Preliminary.
3/ Figures may not add to total because of rounding.

Table 26.--U.S. fish oil 1/ production by raw material source, 1967-71 average, 1971, and 1972

Source	Million pounds			Percentage of total production		
	1967-71 average	1971	1972 2/	1967-71 average	1971	1972
Menhaden	166.6	244.0	165.9	89.6	92.0	88.3
Tuna, mackerel, and anchovy	7.7	8.1	9.2	4.1	3.1	4.9
Unclassified	11.7	12.9	12.8	6.3	4.9	6.8
Total 3/	186.0	265.0	187.9	100.0	100.0	100.0

1/ Excluding whale oil.
2/ Preliminary.
3/ Figures may not add to total because of rounding.

The decline in fish oil production was partially associated with lower menhaden landings and lower oil yields than was the case last year. As indicated in the following table, the average oil yield of menhaden for January-September was about 9 percent of the landed fish compared with 11 percent in 1971.

Table 27.--Menhaden oil yield, January-September

	1970	1971	1972
	Percent		
Atlantic	9.3	9.8	6.5
Gulf	12.8	12.0	10.5
Average	10.4	11.5	9.1

Anchovies, tuna, and mackerel accounted for about 5 percent of the fish oil production in 1972, compared to about 3 percent in 1971.

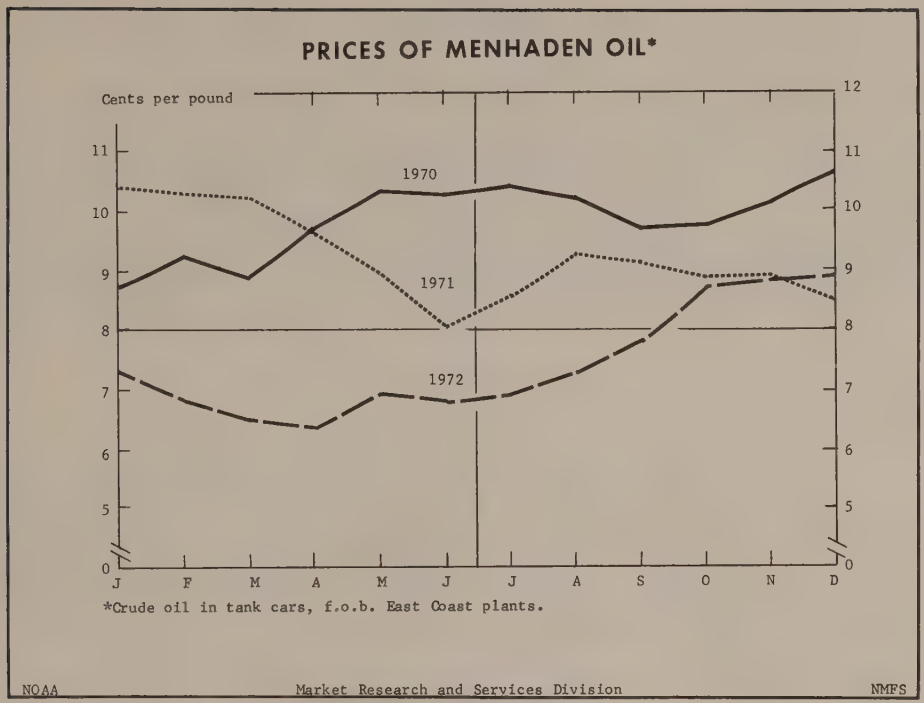

Figure 7

Table 28.--Industrial use of fish oil in the United States, by month, 1970-72 1/

Month	1970	1971	1972 2/
	Million pounds		
January	3.1	2.2	1.9
February	2.9	2.1	2.5
March	2.4	2.0	2.1
April	2.8	2.0	2.0
May	3.2	1.9	2.3
June	3.2	2.8	2.2
July	2.7	2.7	3.5
August	2.0	1.7	3.7
September	2.8	3.0	2.6
October	2.4	1.4	2.6
November	1.9	1.9	2.4
December	2.0	2.9	
Total 3/	31.4	26.5	

1/ Includes marine mammal oil other than sperm oil and some hydrogenated fats (vegetable and animal) and other fats and oils in process.
2/ Preliminary.
3/ Figures may not add to total because of rounding.

Demand

Industrial Use Up

The use of fish oils for industrial purposes increased in the United States during 1972, mainly because of more favorable prices to the user. About 25.3 million pounds were used in January-October 1972--compared with 21.7 million pounds a year before. The use of fish oil continued at a high, above the level in November 1972. During this month, 2.4 million pounds were used--0.5 million pounds more than during the same month a year ago (table 28).

Exports Down From 1971

U.S. exports of fish oil in 1972 were about 193 million pounds, 16 percent less than a year before but 22 percent more than in 1970 (table 29). The largest market for United States fish oil in 1972 was the Netherlands taking about 43 percent of the exports; about 82 million pounds were shipped to the Netherlands in 1972. About 62 million pounds of the United States fish oil went to Sweden in 1972--compared to 40 million pounds in 1971. West Germany received 26 million pounds of fish oil from the United States in 1972.

Prices Recovering

Menhaden oil prices during 1972 were below a year earlier mainly because of substantial increase of world supplies of oils and fats. Prices reached a low of 6.4 cents per pound in April, but have increased since then.

During January-July 1972, menhaden oil prices averaged 6.8 cents per pound--compared to 9.5 cents a year before. Although subsequently strengthening in the August-November period, monthly averages remained slightly below the levels of comparable months in 1971. The average price of menhaden oil in December was 8.9 cents per pound, slightly higher than the year before (table 30 and fig. 7). The increased prices of menhaden oil reflect the shortage of Peruvian supplies in the world market and anticipated increases in world demand.

OUTLOOK

U.S. fish oil production during the first quarter is normally very low because the menhaden fishing season does not begin until April. Most of the oil produced during the first quarter comes from anchovies, tuna and mackerel. We estimate that the production of fish oil in the United States in the first quarter 1973 will be about 2.8 million pounds.

Domestic use of fish oil during the first quarter of 1973 is estimated to be about 7 million pounds compared to 6.5 million pounds a year before. The domestic use is influenced by the ratios of the prices of fish oil to the prices of soybean oil, linseed oil and tung oil. During the fourth quarter of 1972, these ratios were lower than a year ago. The above estimate is based on the assumption that these ratios will continue during the first quarter of 1973.

Because of the shortage of Peruvian fish oil in the world market, export opportunities for United States fish oil have increased. Offsetting this gain is an above average increase in export availabilities of competing oils, mainly palm oil and soybean oil.

Table 29.--U.S. exports of fish oil 1/, by month, 1970-72

Month	1970	1971	1972 2/
	Million pounds		
January	11.1	32.2	14.0
February	0.4	4.9	10.3
March	13.9	0.3	0.7
April	4.3	6.1	.9
May	4.4	4.6	5.3
June	2.4	10.9	11.0
July	30.3	34.7	38.3
August	31.1	43.1	2.0
September	37.8	43.7	32.4
October	.2	4.4	38.0
November	17.9	21.6	6.4
December	4.9	23.4	33.8
Total 3/	158.8	229.9	193.2

1/ Excluding whale oil.
2/ Preliminary.
3/ Figures may not add to total because of rounding.

Table 30.--Average monthly price of menhaden oil 1/, f.o.b. East Coast plants, 1970-72

Month	1970	1971	1972
	Cents per pound		
January	8.75	10.40	7.35
February	2/9.25	10.30	6.85
March	2/8.90	10.20	6.50
April	3/9.70	9.65	6.40
May	3/10.30	8.95	6.95
June	10.30	8.05	6.80
July	10.40	8.60	6.90
August	10.20	9.25	7.30
September	9.70	9.15	7.80
October	9.75	8.85	8.70
November	10.10	8.90	8.80
December	10.60	8.50	8.90
Average 4/	10.15	8.80	7.25

1/ Crude oil in tank cars; prices quoted by brokers at New York City.
2/ Asking price.
3/ F.o.b. Gulf Coast plants.
4/ Weighted average.

APPENDIX

Background Notes on the Peruvian Anchoveta Fishery

Peru's fish meal industry is based on the anchoveta (Engraulis ringens) which are found from Antofagasta, Chile to Punta Aguja, Peru, a distance of about 1,200 nautical miles, and seaward from the beach to 70 nautical miles. These boundaries are very flexible, however, as the fish respond to changes in the Humboldt Current and food availability. The fish are rarely found below 30 meters.

Seasonality of Catch

In general, the anchoveta spawns throughout the year, but with a peak from July through September. During this period, the fish become very dispersed over the fishing grounds and are generally unavailable to the fleet. This fact is substantiated by the low figures for the July to September catch-per-unit-effort figures during the pre-regulatory period. Because the quota is usually reached by June and the spawning peak, the fishery is normally closed from June to August. The fishing season, for regulatory and statistical purposes, therefore, runs from the beginning of September until June. Recruit fish from the June-August spawning begin to appear in landings in late December or early January. A high percentage of these small fish in the catches leads to lower yields of both oil and meal.

Historical Fishing Experience

Scientific monitoring of the fishery began in 1960 with the formation of the Marine Resources Research Institute (Instituto del Mar del Peru or IMARPE). This Institute was created under the guidance of FAO, and is carrying the work forward.

Poor fishing in 1963 caused a drop in annual exports for the first time since fish meal production began in Peru. In the beginning of 1964, Peru's consortium of fish meal manufacturers (later expanded to form the government marketing organization, EPCHAP) experienced difficulty meeting its forward committments and was forced to purchase fish meal on the world market at high prices, causing losses to its members.

Although fishing improved in 1964 and landings of 9 million tons made Peru the leading fishing nation in the world, IMARPE called attention to the possibility that the limits of the anchovy population had been reached. Fears increased when production fell from 1.55 million tons in 1964 to 1.28 million tons in 1965. In August 1965, the government prohibited fishing for 1 month, the first such "veda" (closure) in the history of the industry. This marked the beginning of the government's attempt to conserve the fishery. The regular imposition of a 6-week "veda" during the height of the fishing season in February and March 1967 and subsequent years established an official limit of about 9.5 million tons of anchoveta landings each year.

The imposition of a fishing limit caught the industry just at the end of its great expansion. It has been estimated that the present catching capacity of the Peruvian fleet is sufficient to catch the maximum sustainable yield in 2 months of intensive fishing.1/

FAO 1965 Survey and Recommendations

In 1965, FAO made the first appraisal of the extent of Peru's anchovy stock and the effects of fishing on this stock. In its report, FAO expressed the view that if the fleet maintained its present size, the annual catch of anchoveta per vessel would decrease. FAO, however, did not recommend a closed season nor a substantial catch limitation as clearcut solutions.

FAO's recommendations would essentially: (1) limit the fishing capacity of the fleet to its present level, and (2) keep the production capacity of the fish meal plants in a "reasonable" relation to the availability of the new material.2/

Annual Quotas Set

In an effort to reach a proper balance between the maximum sustainable yield and the productive capacity of the industry, the Peruvian Government has relied on an annual quota and closure of the fishery. In 1968, for the first time, only ports with high percentages of recruits in their landings were closed, although no significant attempt has been made to reduce the productive capacity of the industry. A complicated licensing system has been unsuccessfully employed to reduce plant processing capacity. Since 1966, vessel construction was replaced at a rate equal to the tonnage leaving the fleet. However, construction in 1969-70 was considerably above replacement.

As a result of industry's failure to reduce its plant and vessel capacity, the fishing season (days permitted to fish) has gradually declined from 280 days in 1963-64 to 166 days in 1966-67 and 155 days in 1969-70.

The excessive fleet poses the danger of pressure on government to keep the season open longer than the stock assessment experts recommend. From 1967 to 1971, the 9.5 million ton quota was consistently exceeded and it is believed that even the official figure for production and landings are understated.

1/ Roemer, Michael, "Fishing for Growth", Harvard University Press, Cambridge, Mass., 1970.
2/ Excerpt from FAO, Technical Paper No. 55, December 1965.

Table 31.--Anchoveta caught by season (September 1 to May-June)

Year	Gross metric tons
1965/66	8,096,000
1966/67	8,242,000
1967/68	9,819,000
1968/69	10,066,000
1969/70	10,851,000
1970/71	9,953,000

Source: IMARPE.

"El Nino"

The disappearance of anchoveta from Peru's coast has been attributed to an adverse change in the Humboldt Current. This current circles the entire Pacific in a counterclockwise direction. The anchoveta thrive in the Humboldt Current's cold water (brought up from the Antarctic to Peru's coast) and also obtain their food from its upwellings near the coast. However, there are warm water currents which act against the Humboldt. Above the equator, the Cromwell or Equatorial Current moves eastward with one branch moving south against the Humboldt Current; the main branch of this current moves north in a counterclockwise fashion. A third branch of this current heads into the basin off Panama; it is here that El Nino begins to build, almost 1,000 miles north of Peru. This buildup of warm water that becomes El Nino may take as long as 10 years, as it did when it occurred in 1957.

In addition to the Cromwell Current and El Nino, other warm water currents which move from the central south Pacific eastward tend to warm the Humboldt Current.

It is quite normal for warm currents to move southward, but by March, the Humboldt Current normally gathers sufficient strength to push the warm waters back. According to IMARPE oceanographers, the present anchoveta situation has been aggravated by two additional factors that did not characterize El Nino when it appeared in 1957 and 1965. First, in the early months of this year, for some unknown reason, the spawning of anchoveta was particularly unsuccessful. An FAO report stated that the 1971-72 spawn of anchoveta was only one-seventh normal size. The warm waters advancing from the north caused the existing anchoveta to concentrate in cold water pockets close the Peru's coast from March to May. This condition made the anchoveta easily available to the fleet.3/

Numerous expeditions are being carried out to study the present phenomena with the hope that favorable conditions will return and the fishery will recover. Whether the anchoveta resource has been overfished is still undetermined.

3/ "The Search for Peru's Last Anchovy" Peruvian Times, September 15, 1972, pp. 3-4.

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